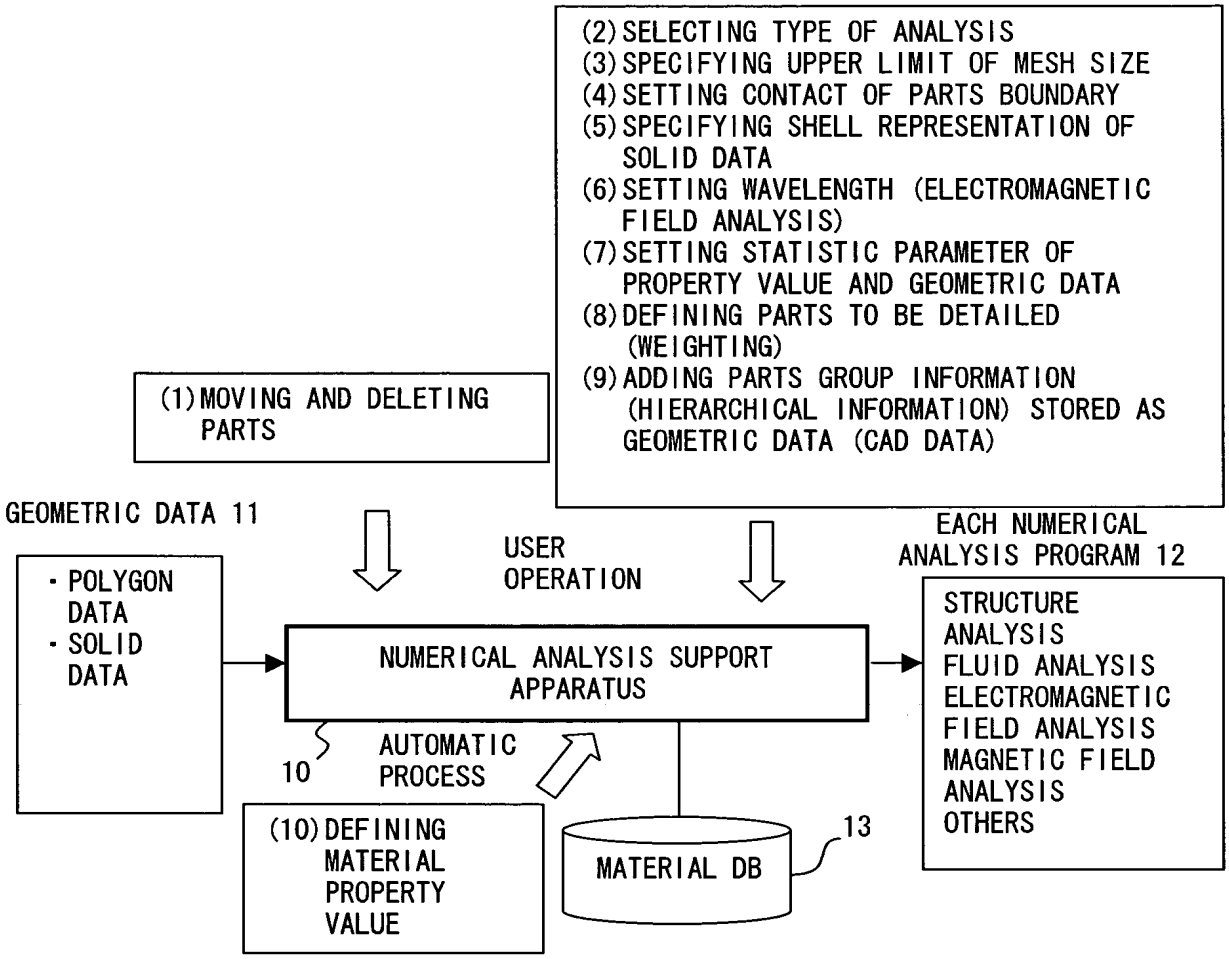

(2) SELECTING TYPE OF ANALYSIS
(3) SPECIFYING UPPER LIMIT OF MESH SIZE
(4) SETTING CONTACT OF PARTS BOUNDARY
(5) SPECIFYING SHELL REPRESENTATION OF SOLID DATA
(6) SETTING WAVELENGTH (ELECTROMAGNETIC FIELD ANALYSIS)
(7) SETTING STATISTIC PARAMETER OF PROPERTY VALUE AND GEOMETRIC DATA
(8) DEFINING PARTS TO BE DETAILED (WEIGHTING)
(9) ADDING PARTS GROUP INFORMATION (HIERARCHICAL INFORMATION) STORED AS GEOMETRIC DATA (CAD DATA)
(1) MOVING AND DELETING PARTS
GEOMETRIC DATA 11
· POLYGON DATA
· SOLID DATA
USER OPERATION
EACH NUMERICAL ANALYSIS PROGRAM 12
STRUCTURE ANALYSIS
FLUID ANALYSIS
ELECTROMAGNETIC FIELD ANALYSIS
MAGNETIC FIELD ANALYSIS
OTHERS
NUMERICAL ANALYSIS SUPPORT APPARATUS
10
AUTOMATIC PROCESS
(10) DEFINING MATERIAL PROPERTY VALUE
MATERIAL DB
13

FIG. 1

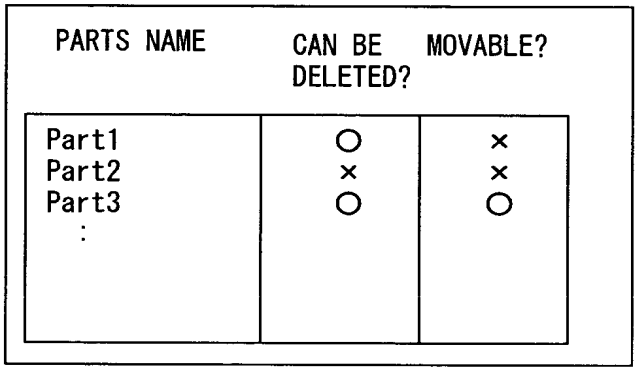


FIG. 2

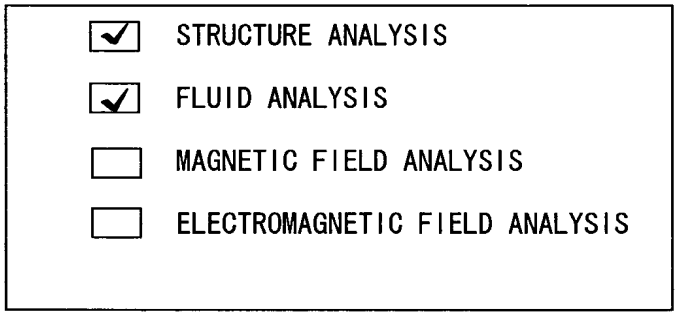

STRUCTURE ANALYSIS
FLUID ANALYSIS
MAGNETIC FIELD ANALYSIS
ELECTROMAGNETIC FIELD ANALYSIS

FIG. 3

FIG. 4

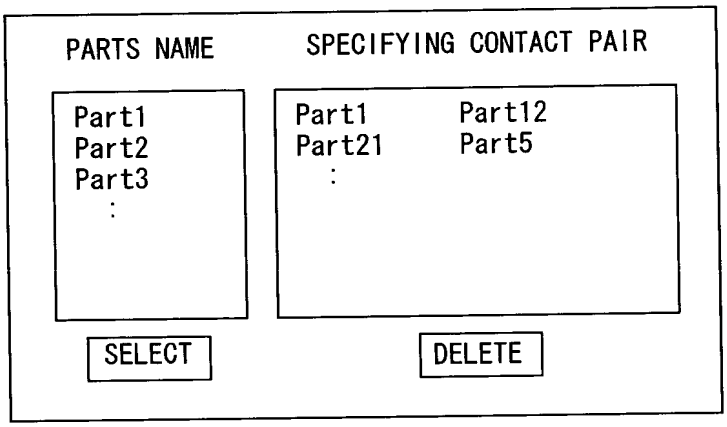

PARTS NAME
SPECIFYING CONTACT PAIR
Part1
Part2
Part3
:
Part1 Part12
Part21 Part5
:
SELECT
DELETE

FIG. 5

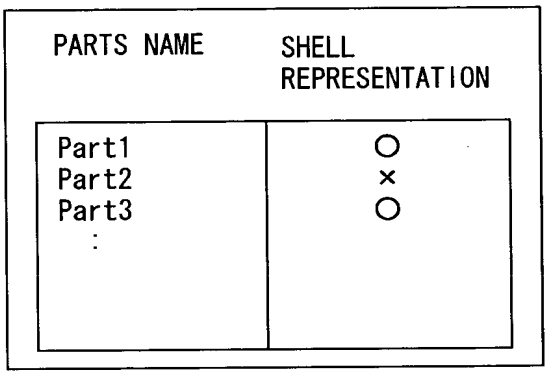


FIG. 6

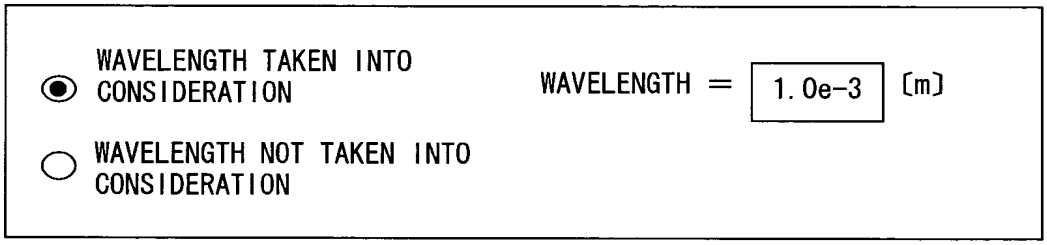
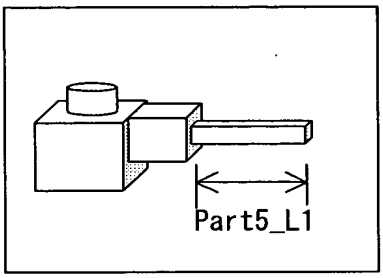

WAVELENGTH TAKEN INTO CONSIDERATION
WAVELENGTH NOT TAKEN INTO CONSIDERATION
WAVELENGTH =
1.0e-3
[m]

FIG. 7



PARTS NAME	SHAPE VARIABLE NAME	NUMBER OF LEVELS	SPECIFICATION OF SIZE RANGE
Part5	Part5_L1	3	15.0 ~ 20.0
Part2	Part2_L2	3	1.0 ~ 3.0
	:		

FIG. 8

PARTS NAME	MATERIAL NAME	PROPERTY NAME	NUMBER OF LEVELS	SPECIFICATION OF PROPERTY VALUE RANGE
Part5	ALUMINUM	CONDUCTIVITY	3	12.0 ~ 20.0
Part2	COPPER	THERMAL CONDACTIVITY	3	32.0 ~ 50.0
	:			

FIG. 9

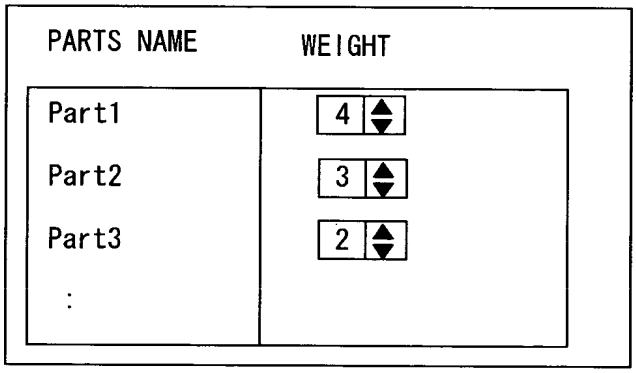


FIG. 10

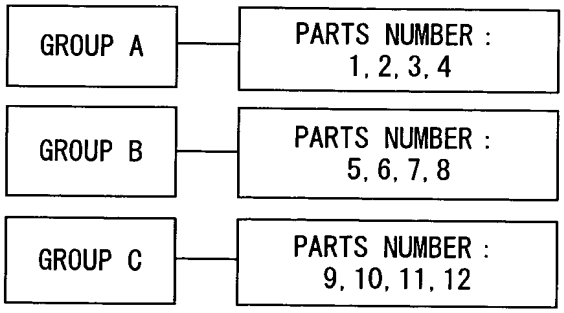


FIG. 11A

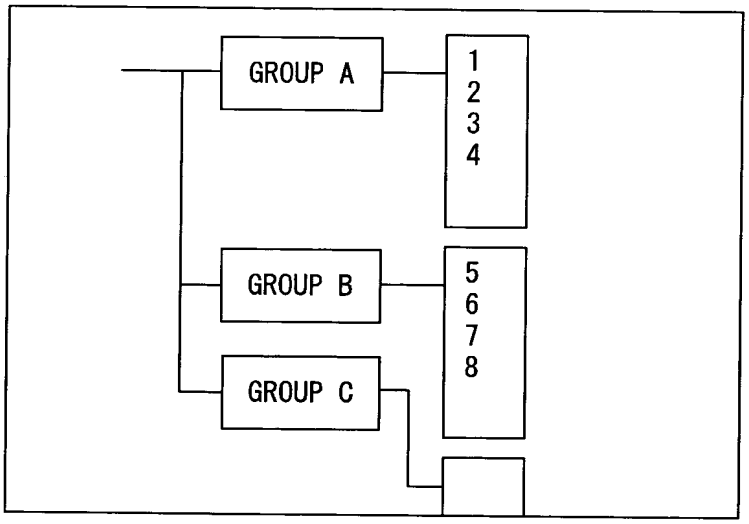


FIG. 11B

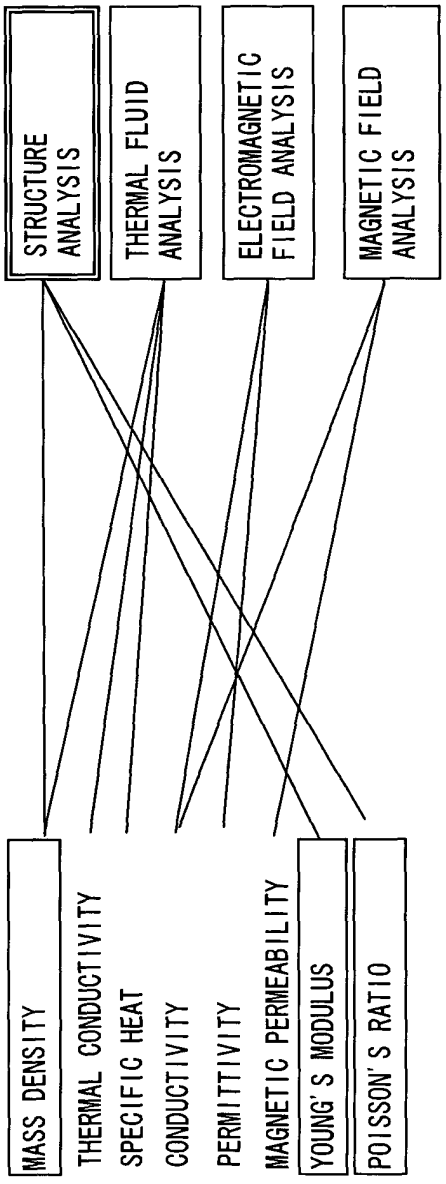

STRUCTURE ANALYSIS
THERMAL FLUID ANALYSIS
ELECTROMAGNETIC FIELD ANALYSIS
MAGNETIC FIELD ANALYSIS
MASS DENSITY
THERMAL CONDUCTIVITY
SPECIFIC HEAT
CONDUCTIVITY
PERMITTIVITY
MAGNETIC PERMEABILITY
YOUNG'S MODULUS
POISSON'S RATIO

FIG. 12

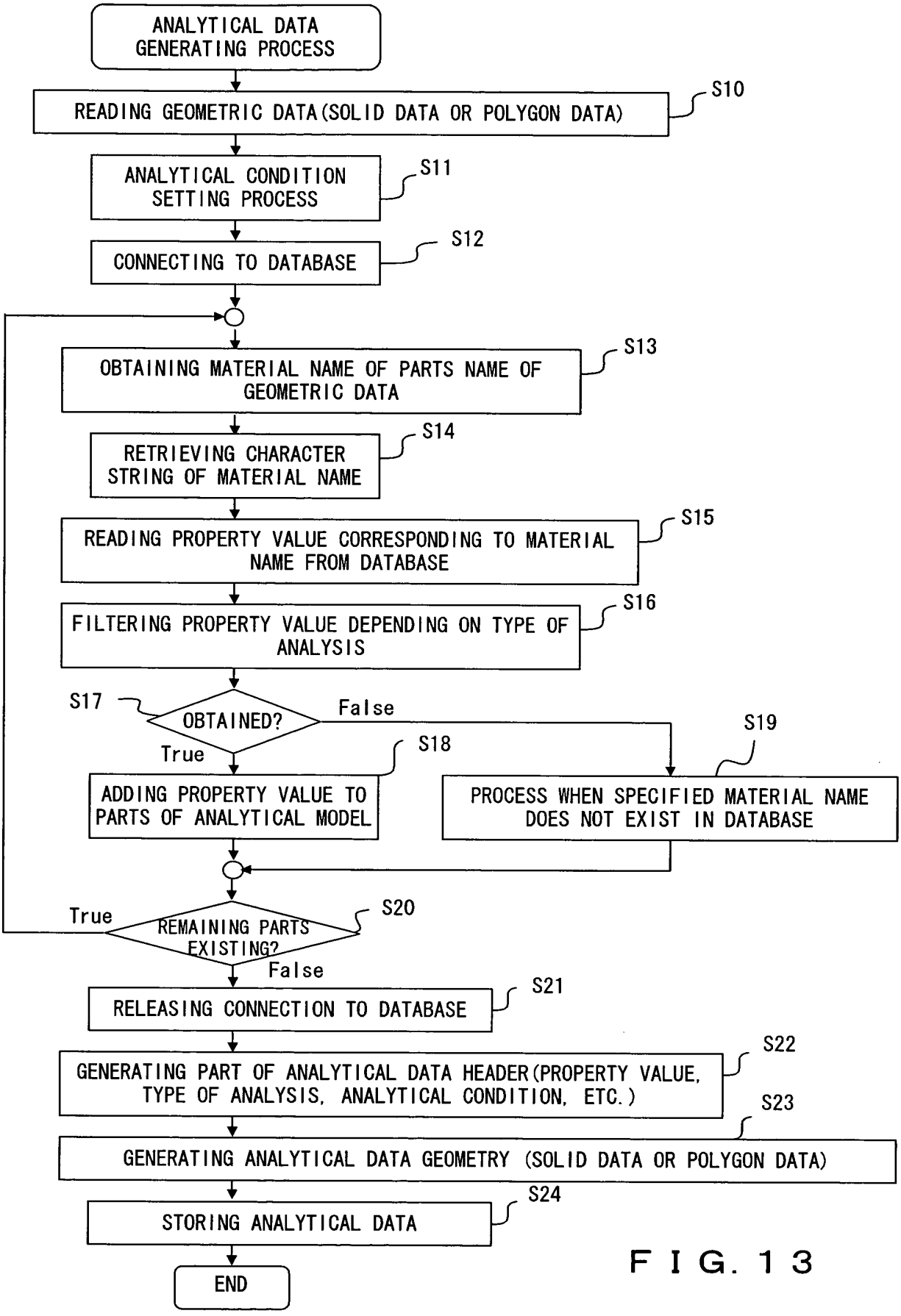

ANALYTICAL DATA GENERATING PROCESS
READING GEOMETRIC DATA(SOLID DATA OR POLYGON DATA)
S10
ANALYTICAL CONDITION SETTING PROCESS
S11
CONNECTING TO DATABASE
S12
OBTAINING MATERIAL NAME OF PARTS NAME OF GEOMETRIC DATA
S13
RETRIEVING CHARACTER STRING OF MATERIAL NAME
S14
READING PROPERTY VALUE CORRESPONDING TO MATERIAL NAME FROM DATABASE
S15
FILTERING PROPERTY VALUE DEPENDING ON TYPE OF ANALYSIS
S16
S17
OBTAINED?
False
True
S18
ADDING PROPERTY VALUE TO PARTS OF ANALYTICAL MODEL
S19
PROCESS WHEN SPECIFIED MATERIAL NAME DOES NOT EXIST IN DATABASE
True
REMAINING PARTS EXISTING?
S20
False
RELEASING CONNECTION TO DATABASE
S21
GENERATING PART OF ANALYTICAL DATA HEADER(PROPERTY VALUE, TYPE OF ANALYSIS, ANALYTICAL CONDITION, ETC.)
S22
GENERATING ANALYTICAL DATA GEOMETRY (SOLID DATA OR POLYGON DATA)
S23
STORING ANALYTICAL DATA
S24
END

FIG. 13

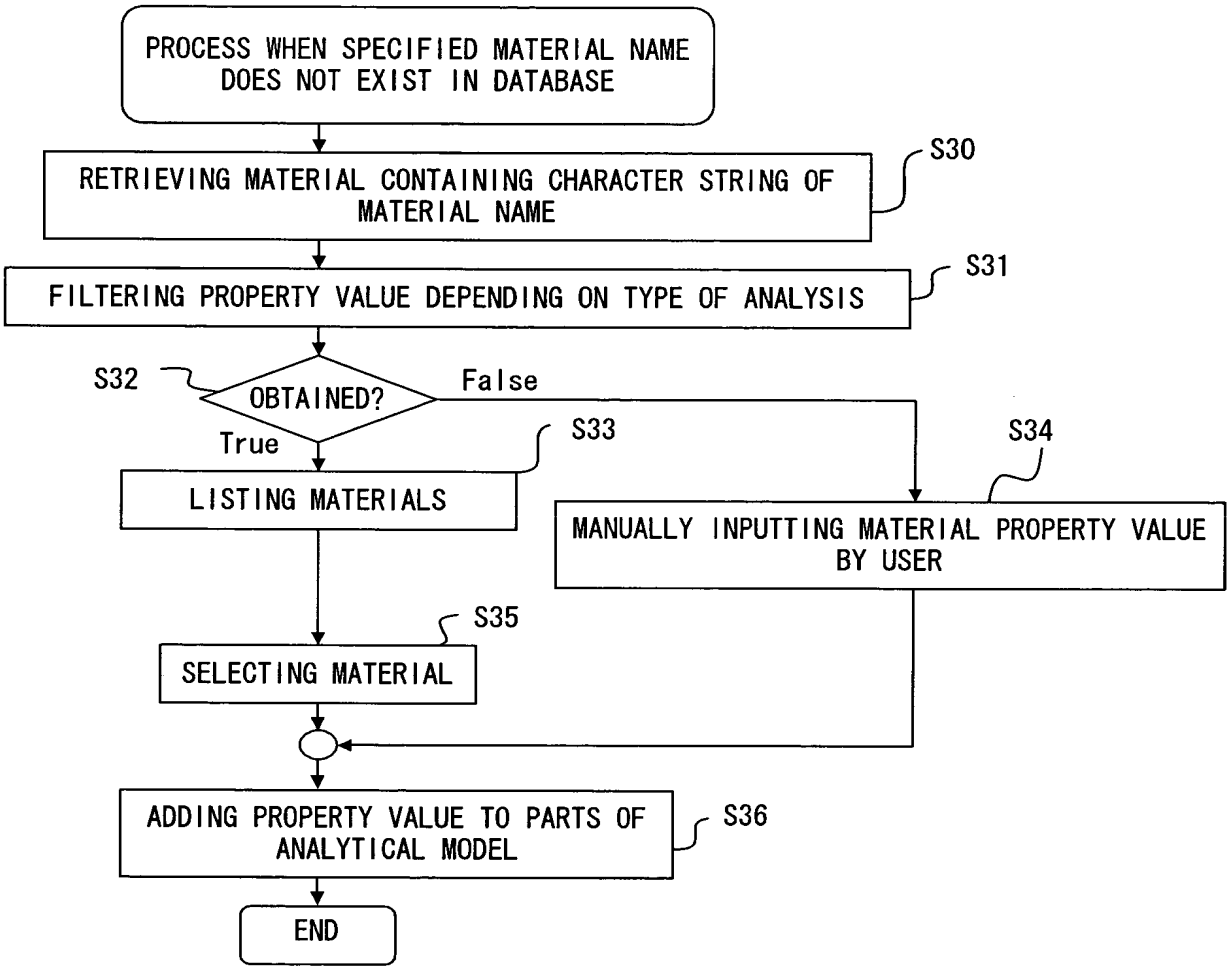

PROCESS WHEN SPECIFIED MATERIAL NAME DOES NOT EXIST IN DATABASE
RETRIEVING MATERIAL CONTAINING CHARACTER STRING OF MATERIAL NAME
S30
FILTERING PROPERTY VALUE DEPENDING ON TYPE OF ANALYSIS
S31
S32
OBTAINED?
False
True
S33
LISTING MATERIALS
S34
MANUALLY INPUTTING MATERIAL PROPERTY VALUE BY USER
S35
SELECTING MATERIAL
ADDING PROPERTY VALUE TO PARTS OF ANALYTICAL MODEL
S36
END

FIG. 14

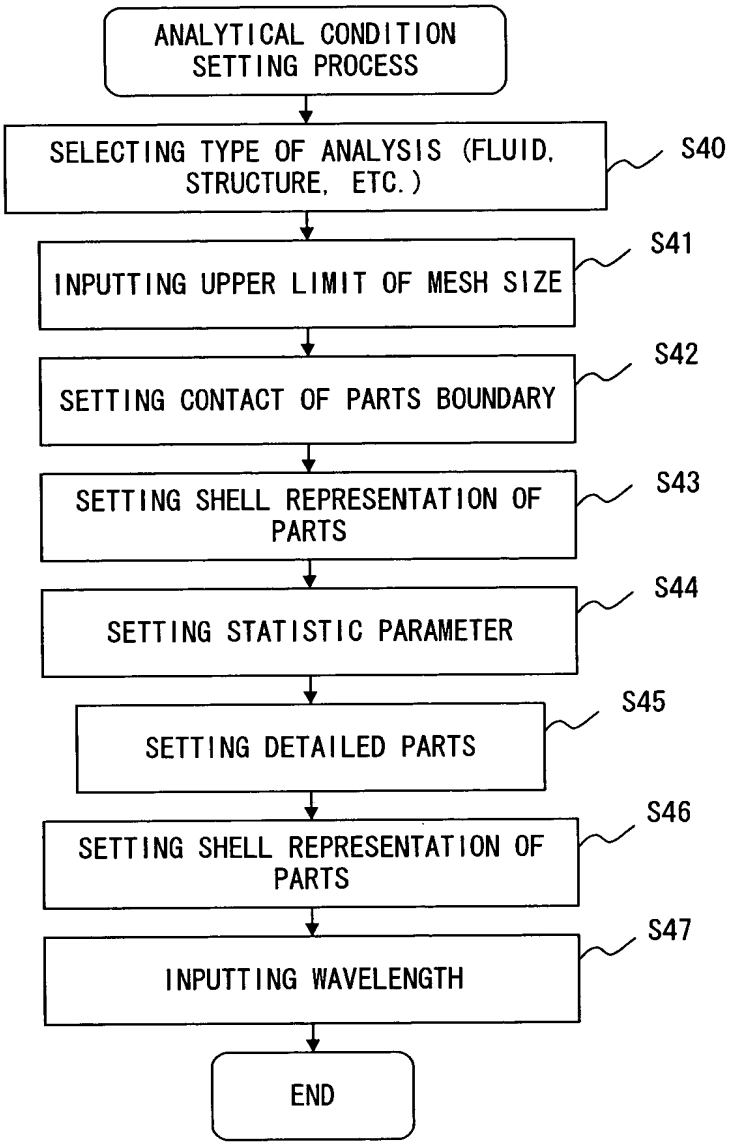

ANALYTICAL CONDITION SETTING PROCESS
SELECTING TYPE OF ANALYSIS (FLUID, STRUCTURE, ETC.)
S40
INPUTTING UPPER LIMIT OF MESH SIZE
S41
SETTING CONTACT OF PARTS BOUNDARY
S42
SETTING SHELL REPRESENTATION OF PARTS
S43
SETTING STATISTIC PARAMETER
S44
SETTING DETAILED PARTS
S45
SETTING SHELL REPRESENTATION OF PARTS
S46
INPUTTING WAVELENGTH
S47
END

FIG. 15

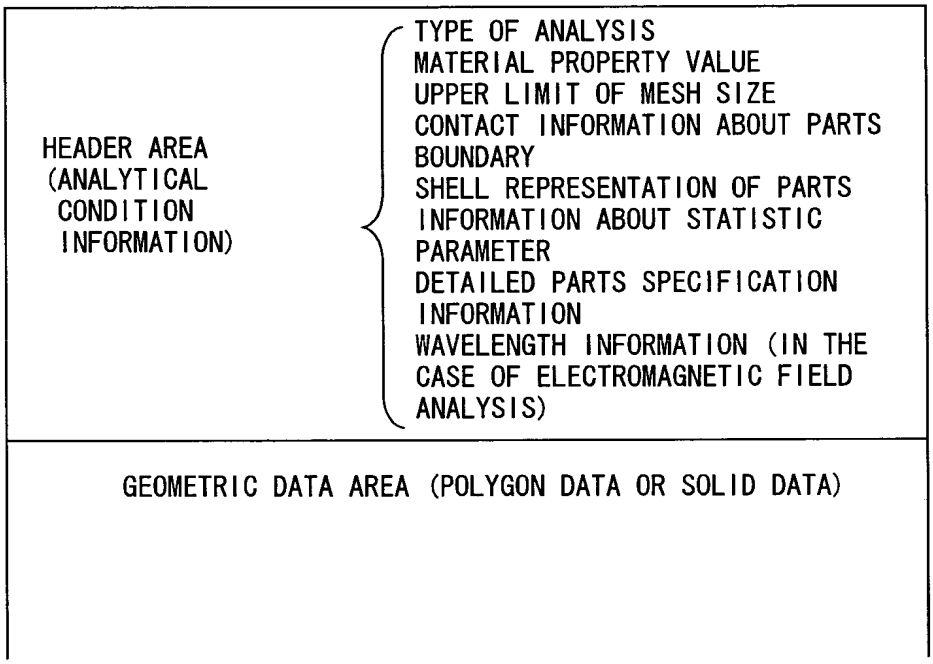

HEADER AREA (ANALYTICAL CONDITION INFORMATION)
TYPE OF ANALYSIS
MATERIAL PROPERTY VALUE
UPPER LIMIT OF MESH SIZE
CONTACT INFORMATION ABOUT PARTS BOUNDARY
SHELL REPRESENTATION OF PARTS
INFORMATION ABOUT STATISTIC PARAMETER
DETAILED PARTS SPECIFICATION INFORMATION
WAVELENGTH INFORMATION (IN THE CASE OF ELECTROMAGNETIC FIELD ANALYSIS)
GEOMETRIC DATA AREA (POLYGON DATA OR SOLID DATA)

FIG. 16

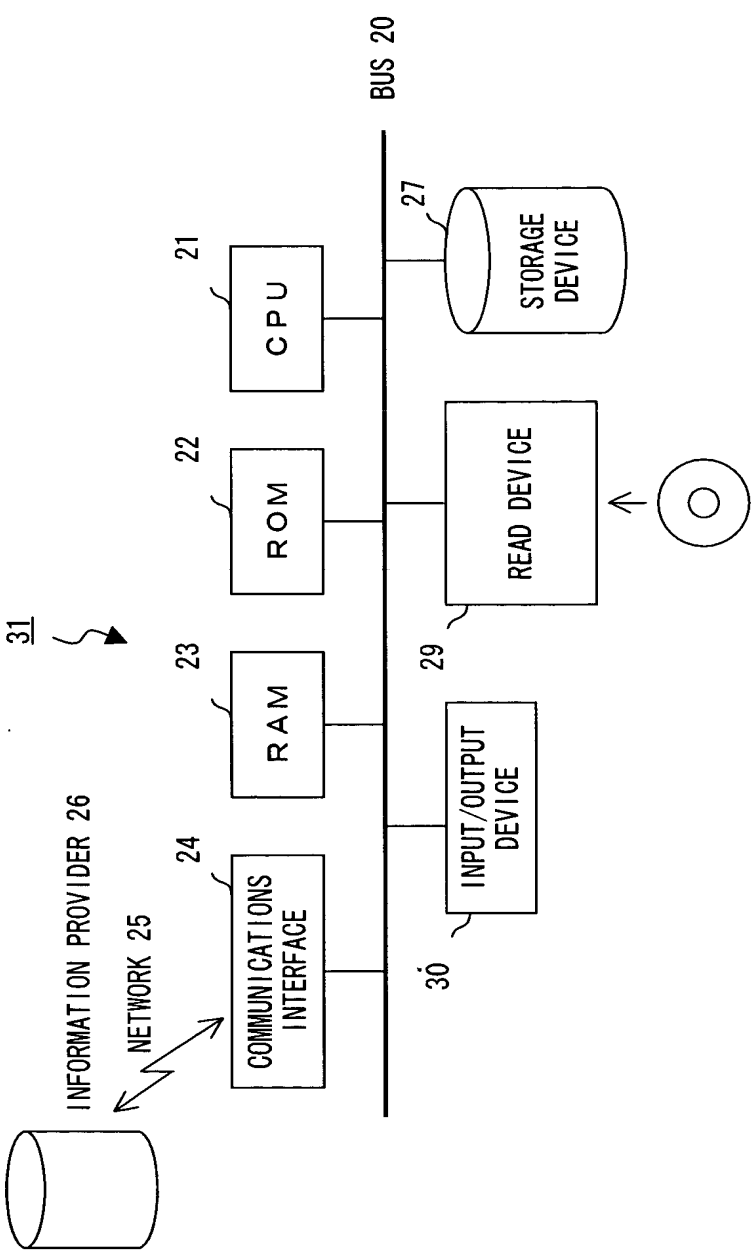

BUS 20
CPU
21
ROM
22
RAM
23
COMMUNICATIONS INTERFACE
24
INFORMATION PROVIDER 26
NETWORK 25
31
INPUT/OUTPUT DEVICE
30
READ DEVICE
29
STORAGE DEVICE
27
PORTABLE STORAGE MEDIUM 28

FIG. 17